

### Definition

The pharynx is a space shared by the respiratory system and the digestive tract. It is divided into three areas: the nasopharynx, the oropharynx, and the hypopharynx. The nasopharynx belongs entirely to the respiratory tract and is located behind the nose. Anteriorly the nasopharynx is defined by the posterior choanae of the nose, superiorly by the anterior and inferior wall of the sphenoid sinus, and posteriorly by the vertebral bodies of the cervical spine. The nasopharynx opens inferiorly into the oropharynx between the distal edge of the soft palate and the posterior pharyngeal wall. Lymphoid tissue known as the adenoids or the pharyngeal tonsils occupies the posterosuperior surface of the nasopharynx and is part of a larger collection of lymphoid tissue known as Waldeyer's ring. The oropharynx opens anteriorly into the oral cavity and inferiorly into the hypopharynx at the level of the base of the tongue. The lateral walls are occupied by the faucial or palatine tonsils, which lie between two folds of tissue, the anterior tonsillar pillar or palatoglossal fold, and the posterior pillar or palatopharyngeal fold. The hypopharynx extends from the base of the tongue to the apex of the pyriform sinuses. The pyriform sinuses are recesses formed between the larynx and the thyroid cartilages of the larynx as they extend beyond the larynx. The pyriform sinuses serve to funnel food from the hypopharynx into the esophagus.

### Technique

Examination of the nasopharynx is difficult and requires special equipment. The simplest way is to use a small mirror (#0 or #1), a headlight, and a tongue blade. The tongue is depressed firmly with a tongue blade, and the patient is instructed to breathe through his or her nose. The mirror is positioned in the throat so that a small portion of the nasopharynx can be seen. The mirror is then rotated gently to examine all portions of the nasopharynx. Care must be taken not to touch the posterior pharyngeal wall because this will cause the patient to gag. A small fiberoptic scope is another method often used to examine the nasopharynx. The scope is passed through the nose after it has been anesthetized with a topical anesthetic into the nasopharynx, and all areas are examined. Even when the nasopharynx can be seen with either method, the presence of mucus, which obscures the mucosal surface and the irregular surface of the adenoidal tissue, makes interpretation difficult.

The oropharynx is examined with a tongue blade and a good light. The tongue blade is placed in the center of the tongue at the junction of the anterior two-thirds and the posterior one-third of the tongue. The tongue is firmly depressed, exposing the pharynx. The examiner should note the presence or absence of the palatine tonsils and their size. The tonsils have an irregular surface with deep

crypts that are often filled with epithelial debris or lymphocytes, particularly when they are infected. The examiner should also note the symmetry of the palato-tonsil area. Bulging of one side with contralateral shifting of the uvula may be indicative of a peritonsillar abscess or parapharyngeal tumor. The posterior pharyngeal wall is the site of a collection of lymphoid tissue that is spread out over the surface. This lymphoid tissue becomes more hypertrophied during upper respiratory infections and has a "cobblestoned" appearance.

The hypopharynx is examined with a mirror (#4 or #5) and a headlight. The patient is positioned in a "sniffing" position, leaning forward slightly. The tongue is protruded and held with the examiner's fingers. A gauze sponge placed over the tip of the tongue provides a better grip as the tongue is gently pulled forward. The mirror is carefully inserted into the mouth and placed to the left or right of the uvula under the soft palate. The palate is then lifted in a single movement, and the mirror is reflected into the hypopharynx. The patient is instructed to say "eeee," which tenses the laryngeal musculature and causes the epiglottis to move anteriorly, exposing the endolarynx. Again, care should be taken not to touch the posterior wall of the pharynx because this will cause the patient to gag. If gagging is a problem, local anesthetic sprayed on the posterior pharyngeal wall will reduce it. The examiner should examine the entire hypopharynx including the epiglottis, the pyriform sinuses, and the larynx. Movement and symmetry of the vocal cords should be noted, as well as any irregularity of the laryngeal mucosa. The true vocal cords are covered by squamous epithelium, instead of respiratory epithelium like the rest of the larynx, and reflect light differently, giving the cords a white coloration. The trachea can sometimes be examined down to the carina, and the clinician should be alert to any possible airway obstruction or lesion in the subglottic airway.

### Basic Science

The role of the pharynx as a conduit for the digestive and respiratory tract brings it into contact with the external environment and makes it susceptible to the various allergens, microorganisms, and carcinogenic substances present there. Inflammation of the pharynx usually produces pain or sore throat through the sensory innervation provided largely by the vagus nerve. Pain in the throat is often accompanied by otalgia, which is actually referred pain produced by concomitant vagal innervation of the external ear.

Many of the symptoms and physical findings in the pharynx are produced by the lymphoid tissue known as Waldeyer's ring, which is common in this area. In the nasopharynx, hypertrophy of the adenoidal tissue can produce nasal obstruction and interfere with the postnasal drainage of mucus produced in the nose and sinuses. This

may lead to infections in the middle ear and the sinuses. In the oropharynx, the lymphoid tissue known as the palatine tonsils has deep crypts in the surface that can harbor bacteria and secretions that can lead to tonsillitis. The size of the tonsils can vary greatly. Size alone has no specific pathologic significance as it depends greatly on the age of the patient and whether or not inflammation and infection are present. In general, the tonsils are quite prominent in children; tonsil enlargement continues until puberty, after which the tonsils tend to atrophy. Tonsillar hypertrophy after this time is common in persons with upper respiratory allergy or in those with recurrent tonsillitis. Lymphoid tissue on the base of the tongue or the lingual tonsils can also become infected or hypertrophied and can produce pain or a feeling of a "lump in the throat" as the vallecula space is filled. The hypopharynx is generally void of lymphoid tissue.

### Clinical Significance

Sore throat is one of the most common complaints seen in physicians' offices. The differential diagnosis would include inflammation due to allergy, infection due to viral or bacterial agents, physical irritation due to postnasal drainage or reflux esophagitis or neoplasm. Diagnosis depends on the integration of information obtained by history, physical examination, and laboratory data, such as throat culture or barium swallow.

Acute pharyngitis is usually viral in origin but may be caused by group A beta streptococcus. These infections are usually accompanied by fever and cervical lymphadenitis. Acute tonsillitis also may accompany pharyngitis and is usually obvious from the appearance of the tonsils, which are studded with purulent material in the crypts and may be covered with a mucopurulent exudate.

Malignant neoplasms can occur in any area of the pharynx; most are squamous cell carcinomas that occur as a result of tobacco use. The nasopharynx is much less often involved than the other areas in most people, except for the Chinese race. In this group nasopharyngeal carcinoma accounts for almost 20% of malignancies. The reason for this is not clear but is probably a combination of genetic and environmental factors. In addition to the squamous cell carcinomas, the presence of minor salivary glands in the pharynx can lead to the development of salivary gland neoplasms both benign and malignant.

### References

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- Snow JB. Introduction to otorhinolaryngology. Chicago: Year Book Medical Publishers, 1979;147-59.